

We claim:

1. A speed cooking oven for cooking a food product, comprising:
 - an oven cavity;
 - 5 at least one cooking rack;
 - at least one magnetron for generating microwaves;
 - at least one rectangular waveguide chamber operably associated with the magnetron,
 - the waveguide chamber having a proximal end near the magnetron, an opposing distal end,
 - and a longitudinal chamber axis;
 - 10 at least one slot opening in the waveguide chamber having a center point disposed
 - along the longitudinal axis, the center point being located a selected distance from the distal
 - end of the waveguide chamber, the slot having a slot length along the longitudinal chamber
 - axis that is less than 0.5 free space wavelength.
- 15 2. The speed cooking oven according to claim 1, wherein each slot is defined by a pair
- of elongated parallel sides connected at each end by semicircular ends, each slot having a
- longitudinal slot axis and a vertical slot axis perpendicular to the longitudinal slot axis, such
- that the center point is located at the intersection of the longitudinal slot axis and the vertical
- slot axis.
- 20 3. The speed cooking oven according to claim 1, wherein each waveguide chamber
- includes first, second, and third slot openings.
4. The speed cooking oven according to claim 3, wherein the selected distance of the
- 25 center point of the first slot opening is 0.5 of the waveguide wavelength.

5. The speed cooking oven according to claim 3, wherein the width of the slot is between about 0.25 inches and 0.35 inches.
6. The speed cooking oven according to claim 5, wherein the first slot is inclined relative to the longitudinal chamber axis, such that the end of the first slot closest to the distal end of the waveguide is higher than the other end of the first slot.
7. The speed cooking oven according to claim 6, wherein the angle of incline of the first slot is between about 10 and 45 degrees.
8. The speed cooking oven according to claim 7, wherein the spacing between each slot is along the longitudinal chamber axis 0.5 of the waveguide wavelength.
9. The speed cooking oven according to claim 8, wherein the second slot is oriented at 90 degrees from the first slot.
10. The speed cooking oven according to claim 9, wherein the third slot is oriented at 90 degrees from the second slot.
11. The speed cooking oven according to claim 10, wherein each longitudinal chamber axis is located between about 0.5 and 2.0 inches above each corresponding cooking rack.
12. The speed cooking oven according to claim 1, further comprising:
a means for reducing interference between e-fields emitted through slots of opposing waveguide chambers.

13. ~~The speed cooking oven~~ according to claim 12, wherein the means for reducing interference between e-fields is inwardly canted opposing waveguide chambers.

14. The speed cooking oven according to claim 12, wherein the means for reducing interference between e-fields is vertically offset waveguide chambers.

15. The speed cooking oven according to claim 12, wherein the means for reducing interference between e-fields is slots in opposing waveguide chambers that are offset along the longitudinal chamber axes of the opposing waveguide chambers.

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16. The speed cooking oven according to claim 12, wherein the means for reducing interference between e-fields is a control system for selectively adjusting the power outputs of the magnetrons.

15 17. A speed cooking oven for cooking a food product, comprising:

an oven cavity;

at least one cooking rack;

at least one magnetron for generating microwaves;

at least one rectangular waveguide chamber operably associated with the magnetron,

20 the waveguide chamber having a proximal end near the magnetron, an opposing distal end, and a longitudinal chamber axis;

at least one slot opening in the waveguide chamber having a center point disposed along the longitudinal chamber axis, the center point being located a selected distance from the distal end of the waveguide chamber; and

25 a thin, non-breakable slot cover for sealing the slots.

18. The speed cooking oven according to claim 17, wherein slot cover is formed from polytetraflouroethylene.
19. The speed cooking oven according to claim 17, wherein slot cover is formed from a fiberglass material.
20. The speed cooking oven according to claim 17, wherein slot cover is formed from mica sheets.
21. The speed cooking oven according to claim 17, wherein slot cover is adhered to the waveguide by a silicone rubber material.
22. A speed cooking oven for cooking a food product, comprising:
an oven cavity;
at least one cooking rack;
at least one magnetron for generating microwaves;
two opposing rectangular waveguides operably associated with the magnetron, each waveguide having a proximal end near the magnetron, an opposing distal end, and a longitudinal chamber axis;
at least one slot opening in each waveguide having a center point disposed along the longitudinal chamber axis, the center point being located a selected distance from the distal end of the waveguide.
23. The speed cooking oven according to claim 22, wherein the opposing waveguides are canted inwardly, so as to reduce interference between e-fields emitted through the slots of the opposing waveguides.

24. The speed cooking oven according to claim 22, wherein the opposing waveguides are vertically offset, so as to reduce interference between e-fields emitted through the slots of the opposing waveguides.
- 5 25. The speed cooking oven according to claim 22, wherein the slots in opposing waveguide chambers are offset along the longitudinal chamber axes of the opposing waveguide chambers, so as to reduce interference between e-fields emitted through the slots of the opposing waveguides.
- 10 26. The speed cooking oven according to claim 22, further comprising:
a control system for selectively adjusting the power outputs of the magnetrons.
27. The speed cooking oven according to claim 22, further comprising:
a thin, non-breakable slot cover for sealing the slots of each waveguide.
- 15 28. A speed cooking oven for cooking a food product, comprising:
an oven cavity;
at least one cooking rack;
a single magnetron for generating microwaves;
at least two rectangular waveguide chambers operably associated with the magnetron,
20 the waveguide chambers having proximal ends near the magnetron, opposing distal ends, and longitudinal chamber axes;
at least one slot opening in each waveguide chamber having a center point disposed along the longitudinal axes, the center points being located selected distances from the distal ends of the waveguide chambers, the slots having slot lengths along the longitudinal chamber
25 axes that are less than 0.5 free space wavelength.